

## Chapter 2

# THE UPDATED PLAN

### BACKGROUND

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This amendment to the Transportation Element of the adopted ***Comprehensive Plan for Tippecanoe County*** identifies transportation needs based on historic trends, current circumstance and projected population and employment growth, set within the context of the Land Use Element of the ***Comprehensive Plan***. The modeling process we used recognizes that traffic pattern forecasts are a function of:

- the type and nature of existing and projected roads;
- the interrelationships between land uses, including their distribution and intensities; and
- the socioeconomic characteristics of the population being served.

Previous origin-destination studies show that 67% of our automobile trips have home as an origin or destination. Further, 15% of our home-based trips get us to or from work while the rest are made for shopping, socializing, recreating, getting medical attention, conducting personal business, or getting to and from school.

The traffic forecast modeling process is based on this hypothesis: When relationships between **current** travel patterns and land use can be mathematically defined through reasonably accurate data, then that mathematical model can be used to generate **future** travel patterns based on projections of future land use. The model then becomes a tool first for anticipating network problems that will result from future land use patterns,

and second for testing solutions to those problems. Later on, the model will allow us to keep evaluating the roadway network as new or unforeseen developments occur, and to measure the traffic impact of specific proposed projects.

The model relates population and employment by assigning vehicle trips -- between places where we live and places where we work, go to school, shop, etc. -- to the available system of roads. We created a computerized network, replicating the community's system of major roads. We divided land within the study area into traffic zones -- in this study, 199 of them -- each with a "centroid" and one or more "connectors" to major nearby roads in the network. Each traffic zone was assigned a number of dwelling units, population, number of autos, and a number of retail and non-retail jobs.

We used standardized "levels of service" to gauge traffic congestion. They reflect a given stretch of road's ability to handle a given traffic volume. They range from A to F: A represents a virtually empty road; C, adequate traffic flow; and F, gridlock. Physical factors, such as number and width of lanes, determine how much traffic a road can handle. Using color-coded lines, levels of service for road segments can be easily mapped, based on current and projected traffic volumes. The resulting graphics clearly demonstrate which road segments are handling traffic loads, and which ones are not, which roads can be projected to be congested, and which solutions will work.

In order to "calibrate" a traffic forecast model -- that is, make it resemble real life -- one first assigns each traffic zone actual dwelling unit, vehicle registration, population, and job counts for a recent year. The model is then run, generating a series of traffic volumes for each segment of every major road. The model-generated volumes are then compared to actual traffic

counts made during the same time period. Minor adjustments are made to "connectors" and "centroids" until model-generated traffic volumes actually match traffic counts.

With accurate dwelling unit and employment numbers, we then calibrated the base year network. We created a network of roads using the computer to precisely simulate conditions as they physically existed in 1999. In the computer modeling process, roads are called "links" because they are linked or joined together. To join the links, a series of connectors called "nodes" are used. As stated earlier, the model is divided into traffic zones. It is within each traffic zone where the "activities" are assigned. "Activities" are the independent variables such as the number of dwelling units, employment, and autos that were allocated to each traffic zone. Each of these "activities" is assigned to the middle of the traffic zone to what is called a centroid. It is from these centroids where the number of trips both internal and external are generated. The number of trips created by each traffic zone is then converted into traffic volumes on the network.

We fine tuned the **1999 Calibrated Network** to within 2% of actual traffic volumes. Using the calibrated model, we then generated scenarios representing traffic patterns in 2010, and 2025. In each case, projected volumes for road segments were translated into Level of Service (LOS) maps. Staff prepared three scenarios for 2010: a **2010 No-Build System**, a **2010 Existing plus Committed System**, and the **2010 E plus C Alternative**. The no-build shows a network of roads as in 1999 but with no additions or alterations. Road projects that either have been built, are under construction, have already been planned and funded, and/or have been planned but not funded by the year 2010 are included in the second scenario. Finally, the third alternative melds the existing plus committed

improvements together with suggestions generated through the Citizens Participation Committee meetings. This is the adopted plan for 2010.

For 2025, we generated four types of transportation networks for analysis: a no-build network, two alternative tests, and the adopted 2025 Plan network.

**The 2025 No-Build System** shows a network of roads as per 2025, with no addition or alteration to the 2010 network. Improvements from previous plans plus suggestions gathered through the Technical Transportation, Administrative, and Citizens Participation meetings were variously combined. They are shown in the two **Alternative Networks**. Selected improvements from the **Alternative Networks** were brought together forming the **2025 Transportation Plan**.

Many alternative road projects were tested. By testing various improvements, staff, with assistance from the Technical Transportation Committee, the Administrative Committee, and Citizens Participation Committee meetings, was able to select feasible, alternative projects.

Finally, we attempted to prepare a realistic, staged implementation program, based on cost estimates and anticipated financial resources. With the federal budget picture as clouded as it is, we can only guess at the nature and amounts of federal and local funding that will be made available over the twenty-five years covered by this plan. But our plan is an optimal one, filled with solutions to most of our congestion problems. We will be prepared to improve our highway network as funds become available.

## AN OVERVIEW

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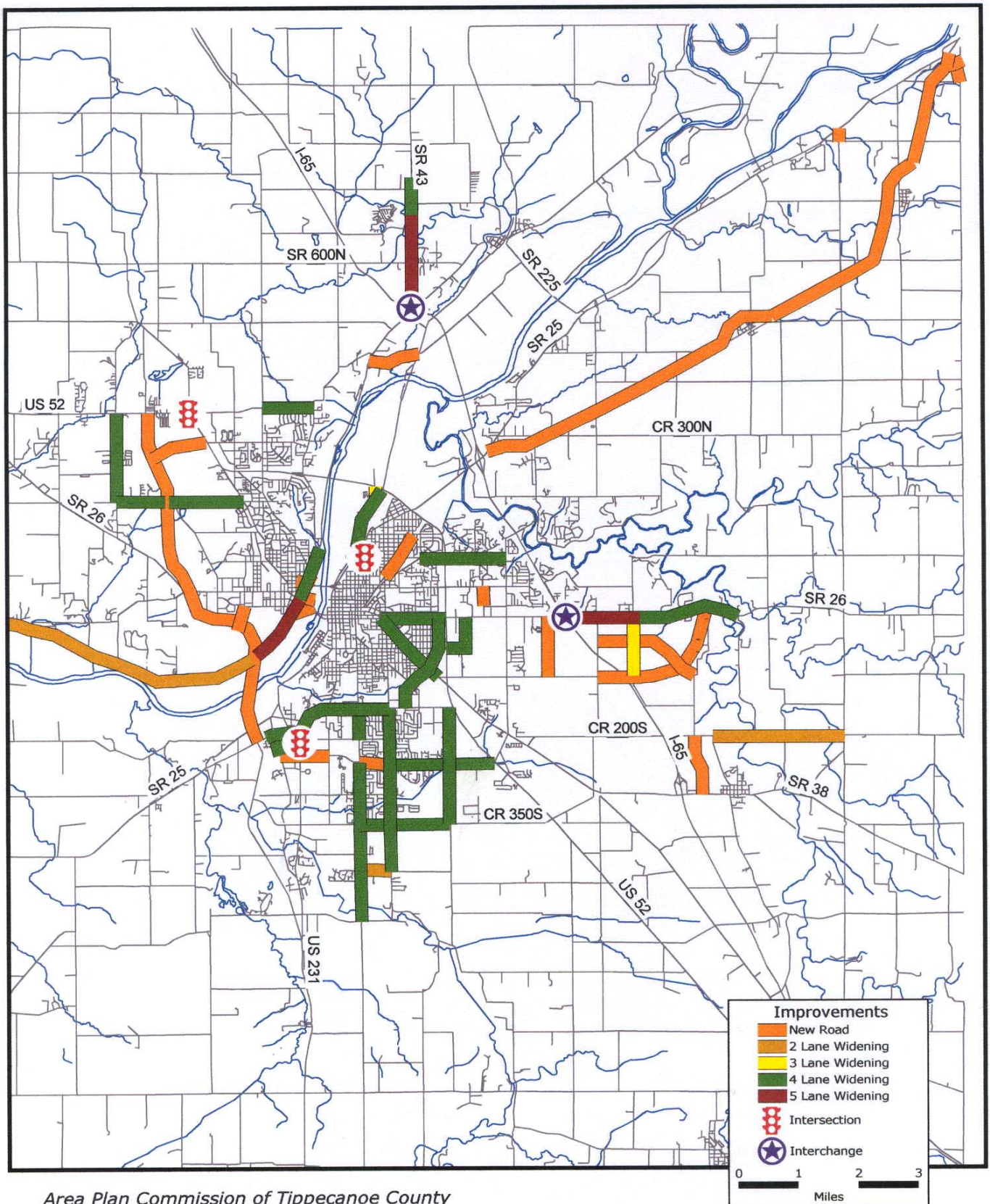
### IMPROVEMENTS, 1999 – 2010:

**Figure 1** shows planned changes into the first decade. We have included all network improvements that are completed, currently being developed, that have been programmed in our Transportation Improvement Program (TIP), are part of the state's TIP, and in the ***Transportation Plan for 2015***. All of these projects have either started construction or are scheduled for construction this decade. We call this the ***2010 E plus C Alternative***.

The final chapter of Railroad Relocation closes. In segment five, the Norfolk Southern railroad corridor is moved. In the spring of 2001, trains no longer traverse the old diagonal rail corridor. Shortly thereafter road reconstruction begins at each of the old crossings. Erie Street will extend northward connecting to Greenbush and Underwood Avenues. Motorists will never again be delayed in downtown Lafayette because of a train passing through.

A significant roadway improvement will be the US 231 Relocation Project. With the southern segment, new bridge, and northern segment up to the Harrison Bridge completed in 2001, the remaining work will involve taking US 231 from South River Road to the north, and around Purdue's campus to the west. Its northern terminus will be at US 52. The facility will remain a four lane, median-divided limited access by-pass. The new alignment will go north from its intersection at South River Road, around the Purdue Airport to the east, and then head west where it will cross SR 26 just east of the SR 26/Newman Road intersection. From there, the road will go north where it

Figure 1  
Planned Improvements Between 1999 to 2010



ties in with McCormick Road north of the McCormick Road/Lindberg Road intersection. McCormick Road will be improved to four lanes up to its terminus at US 52. Intramural Drive will be extended south through campus, to meet realigned US 231. It will also serve as the point of access to the new airport terminal. Cumberland Avenue will be extended across from US 52 to the new US 231 alignment.

In conjunction with the US 231 project, the City of West Lafayette will be constructing two new roads in and near Wabash Landing. One is the extension of Tapawingo Drive from SR 26 to Williams Street. Designed as a four-lane facility, this will provide access to Purdue's south campus and help to eliminate much of the traffic that would pass through the State/River Road intersection and Chauncey Village. The City also plans to extend Tapawingo north and then west between Wabash Landing and Levee Plaza to Howard Avenue. This new road will also reduce traffic that would pass through the State Street/River Road Intersection and that normally would use Brown Street.

While the majority of road projects planned in this network are on a local scale, one project in the **2010 E plus C Alternative** has more of an impact regionally than locally: the **Hoosier Heartland Industrial Corridor**. The corridor is a proposed four-lane median-divided facility with limited access that would create a safer and faster route from Lafayette to Fort Wayne, while providing greater access to Lafayette's industrial base. Locally, it would take traffic from SR 25 N, which is currently over capacity and very hazardous. Parts of the project have already been planned or completed between Logansport and Fort Wayne. The Lafayette to Logansport section is all that remains.

Currently INDOT is working toward selecting the new route location. A consultant is preparing the Environmental Impact Statement. When completed, a corridor will be recommended. The Area Plan Commission has studied all four proposed corridors and selected a modified O-WA alignment. The modified alignment would be adjacent to the Norfolk Southern railroad tracks. This would combine two substantial, major transportation corridors (railroad right-of-way) into one multimodal corridor producing substantial benefits. The one safer multimodal corridor would allow at-grade rail crossings to be closed or bridged from the I-65 interchange to CR 900E and beyond. It would also minimize agriculture land severance and minimize disruption of the steep and wooded slopes and areas more suited to rural residential development, and environmentally sensitive flood plains.

The APC recommended route would begin just north of the Interstate 65 interchange. It would almost immediately curve eastward paralleling the Aretz Airport southern property line. Just before it reaches the Norfolk Southern railroad tracks it would once again curve and follow the tracks northeastward. It would continue this path until it reaches the town of Buck Creek and at CR 600N. The route would by-pass the town of Buck Creek on its western and northern sides. North of CR 600N, the new route would traverse more northerly than easterly passing by the western side of Colburn. Access to this four lane limited access route would be at CR 500E, CR 750E, CR 900E, CR 600N and the East County Line road.

Outlined in all three previous Plans, this Plan Update continues an “inner-loop” for southern Lafayette via Old Romney Road, Twyckenham Boulevard and Brady Lane. Constructed as a four-lane facility, the loop would begin at SR 25 with the widening of Old Romney Road south approximately four tenths of a mile. A new portion of Twyckenham Boulevard would be built from that point eastward to its existing location. Between 9<sup>th</sup> and 18<sup>th</sup>



Street, it would pass over the Norfolk Southern railroad tracks via a new bridge. Brady Lane would then be widened its entire length completing the “inner-loop.”

The plan calls for a number of radial street improvements before the end of the decade. Radial streets bring traffic into the central cities. The streets will be widened to create more capacity. The projects include:

1. North 9<sup>th</sup> Street to four lanes from Greenbush to Duncan Road;
2. Duncan Road from North 9<sup>th</sup> to US 52;
3. Greenbush Avenue widened to four lanes from Elmwood Street to Creasy Lane;
4. SR 26, or South Street, from Main Street to US 52;
5. Main Street with parking removed and restriped to four lanes from South Street to McCarty Lane;
6. South 9<sup>th</sup> Street to four lanes from Teal Road to Beck Lane, and from Twyckenham Boulevard to CR 510S;
7. South 18<sup>th</sup> Street to four lanes from Teal Road to CR 430S;
8. Concord Road to four lanes from Teal Road to CR 350S;
9. Lindberg Road from Northwestern Avenue to McCormick Road, McCormick to relocated US 231;
10. North River Road from Robinson Street to Happy Hollow; and
11. Kalberer Road from Salisbury to Soldier's Home Road.

Radial improvements beyond the urbanized areas include:

1. SR 43 to five lanes from I-65 to north of CR 625 N, then four lanes to north of CR 725N;
2. SR 26 to five lanes east of I-65 to just east of CR 550E;
3. SR 26 to four lanes to the Wildcat Creek;
4. McCarty Lane to four lanes from CR 500 E to SR 26.

Originally identified in the 1978 Transportation Plan, the SR 25 corridor (between relocated and existing US 231 and Teal Road), and the US 231 corridor (between south and north SR 25 intersections) south of Lafayette are again identified as congested corridors. This Plan Update calls for INDOT to address these congested corridors early in the decade, widening them to four lanes.

With increases in traffic volume on SR 43 and SR 26 at the Interstate, both interchanges will no longer be able to function adequately in the future. Improvements to the ramps, signals, and number of lanes are needed.

Several projects in Lafayette have been identified for widening that will result in relieving congestion on US 52. Earl Avenue from South Street to Teal Road is currently a very wide two-lane road. This Plan update calls for the removal of parking and restriping to four lanes. East of US 52, the City will widen Kossuth Street and Farabee Drive from US 52 to SR 26 to four lanes.

Currently INDOT is improving the Harrison Bridge and North River Road interchange as part of the US 231 relocation improvements. On the north side of the bridge two ramps were constructed. Traffic traveling westbound on the Harrison Bridge can exit and turn either north or south onto River Road. The other new ramp allows northbound traffic on River Road to access the bridge and enter Purdue and West Lafayette. With this configuration, southbound traffic on River Road must continue to filter through existing local streets to enter campus and West Lafayette. This Plan update identifies, as a project, the need to correct this missing connection by redesigning the north to westbound on ramp.

Local road improvements are not limited to the urban area. Currently the County is widening CR 200S from Dayton Road to CR 900E. This completes the entire corridor from SR 38 to CR 900E. With the construction of a new elementary school on CR 430S, the County will widened and improved CR 430S from South 9<sup>th</sup> to South 18<sup>th</sup> Streets. To the west, traffic volume continues to increase on Klondike Road. The section between US 52 to CR 200N needs to be improved to a four-lane facility.

County Road 350S has become a successful south-side corridor. Usage continues to increase each year as is evident by the increasing traffic volume. The model projects that within the next ten years, traffic will increase beyond the capacity of a super two-lane road. This Plan update identifies the need for widening it to four lanes from South 9<sup>th</sup> Street to Concord Road. This Plan indicates needed improvements to CR 350S remain with local government and not becoming a state highway. Residential growth on both sides of the corridor continues exponentially. Two and one half miles of the road are already within City limits. If proposed or relocated as SR 25, INDOT would not be relocating the state route outside of the City, just not on Teal Road.

Two projects are to be built by developers. Park East Boulevard will connect SR 26 to McCarty Lane. A portion has already been built with the construction of a Super Wal-Mart. Just to the east of I-65, Stable Drive will be constructed east of CR 500E to CR 650E. Both roads will be constructed as Collectors.

Other improvements in the **2010 E plus C Alternative** include:

1. Creating a Prophetstown State Park connector from SR 43 to North 9<sup>th</sup> Street;
2. Constructing a new road, Yost Drive, between CR 200S and SR 38 just west of the Town of Dayton;
3. Extending Shenandoah south of Union Street to SR 26;
4. South River Road widen to a super two lane from CR 700W to relocated US 231;
5. CR 550E widen to a three lane facility from McCarty Lane to SR 26;
6. Installing a new traffic signal plus road improvements at US 231 and Beck Lane;
7. Installing new traffic signals at Greenbush at 14<sup>th</sup> and 15<sup>th</sup> Street; and
8. Installing a new traffic signal at Morehouse and Kalberer.

## **IMPROVEMENTS, 2011 – 2025:**

**Figure 2** provides the final piece to our transportation network puzzle. It shows the results of our tests of several alternatives that would best relieve 2025 transportation system problems, within realistic goals and objectives. We call this plan the ***2025 Transportation Plan***.

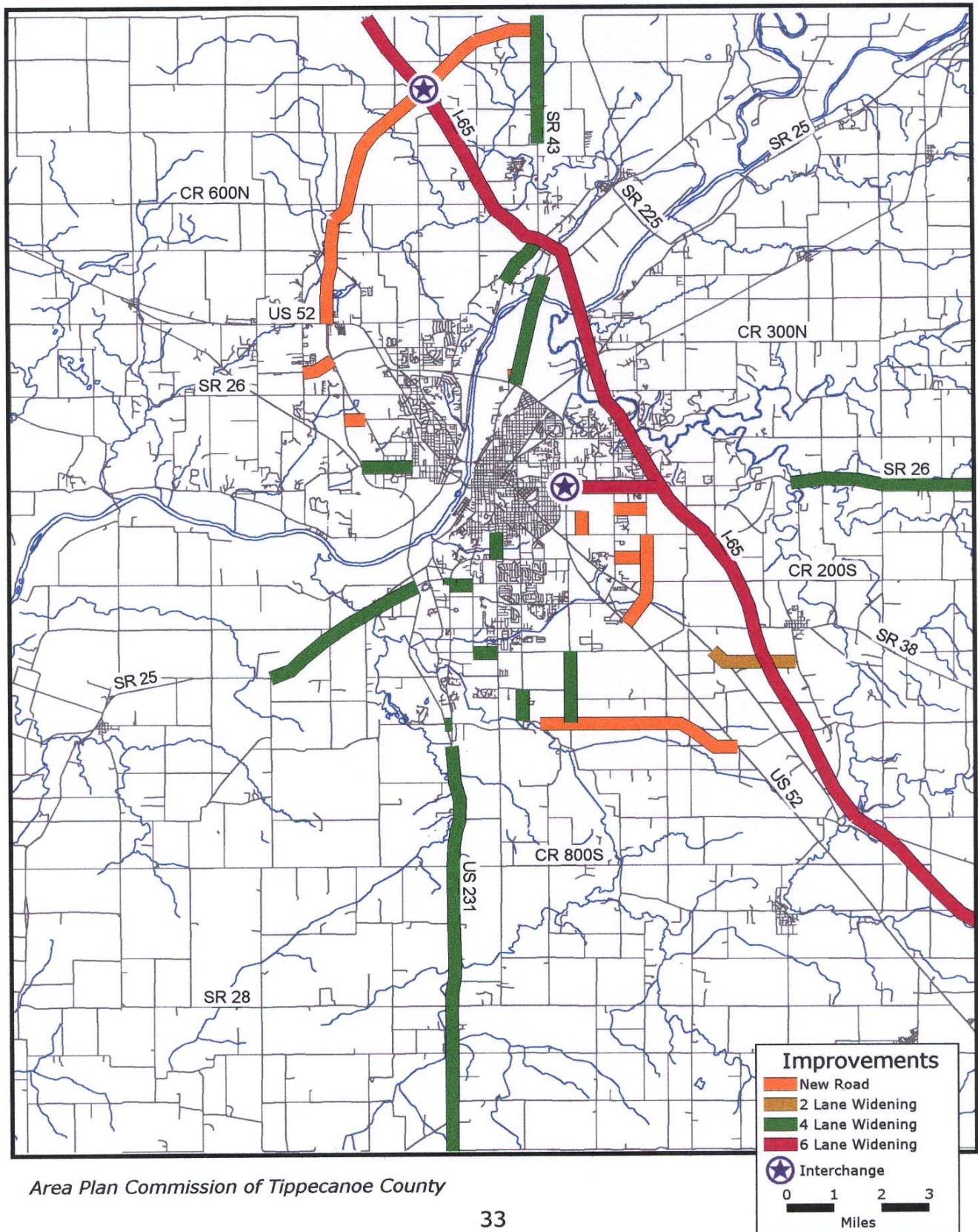
During the previous ten years, construction will have pushed the relocation of US 231 north to US 52. In this Plan's second phase, construction continues northward to a new interchange at I-65. This would then complete a circular by-pass around Lafayette and West Lafayette by using I-65, CR 500E/CR 475E via SR 26, CR 350S, and US 231. The new road would be constructed as a limited access divided four-lane facility.

Construction would not stop at the interchange at I-65. Pushing eastward, a new road, similar in design to US 231, would connect the Interstate to SR 43. The new intersection at SR 43 would be located just south of the Tippecanoe County line. Through alternative testing, it was found that if this project were not built, the growth in traffic volume by 2025 would overburden the five and four lane improvements slated north of I-65 in 2001 and 2002.

Already identified in INDOT's long-range Plan, this Plan update confirms the need to widen I-65 to six travel lanes. Combining the continued growth of through traffic, along with local traffic using the Interstate as a by-pass, estimated volumes warrant the widening throughout the entire County.

State Road 26 between the Interstate and US 52 continues to be the "bulls eye" for retail development. This trend is predicted to continue throughout the Plan's last decade and a half. Four lanes simply can not handle the

Figure 2  
Planned Improvements Between 2011 - 2025



estimated 50,000-plus vehicles a day. To relieve congestion, this portion of SR 26 needs to be widened to six lanes.

Because of heavy traffic on both SR 26 and US 52, the intersection of these state roads continues to be congested. A solution that would increase capacity while limiting right-of-way needed would be a modified interchange: through and right-turning vehicles would continue to use the existing intersection, but all left-turning vehicles would be directed to a secondary elevated intersection (center – turning overpass).

With continued growth in employment and retail development, Lafayette has become a major regional attractor. This is easily confirmed by observing increased traffic volumes on all state roads crossing County boundaries. We foresee this trend continuing through the life of this Plan. By 2025, traffic volumes on SR 43 north of CR 725E, SR 26 east of the Wildcat Creek, US 231 south of the new construction, and SR 25 from new US 231 to CR 375W will all pass the point where two-lane roads can no longer handle the volume safely. All four roads need to be widened to four lanes.

Connectivity between major roads continues to be important. Similar in scope to CR 500E and CR 350S improvements, a new road, a combination of new construction and improvement, and the reconstruction of another road are all scheduled for construction during this phase of the Plan update. Just west of West Lafayette, Cumberland Avenue will be extended westward to intersect Klondike Road at CR 250N. South of Lafayette, CR 500S between CR 250E and CR 450E will be reconstructed. New construction both west and east will connect Wea School road to US 52 at Wyndotte Road. Near the Town of Dayton, the portion of New Castle Road and CR 375S will be improved.

Continuing the theme of improving radial streets, additional portions of the network will be widened to four lanes. The projects include:

1. North 9<sup>th</sup> Street from US 52 to Swisher Road;
2. Concord Road from CR 350S to CR 500S;
3. 9<sup>th</sup> Street from Central Avenue to Teal Road;
4. South 18<sup>th</sup> Street from CR 430S to CR 500S;
5. SR 26 from relocated US 231 to Russell Street;
6. Old US 231 from SR 25 (south intersection) to Beck Lane; and
7. Cherry Lane extended to relocated US 231.

Part of the collector system, Park East Boulevard between Creasy Lane and CR500E, will be extended. A new road will extend southward connecting to Haggerty Lane, SR 38 and eventually US 52. Two additional collectors will connect Creasy Lane to Park East Boulevard, one between SR 26 and McCarty Lane, and the other between McCarty Lane and Haggerty Lane.

Once again, a number of roads will be widened to handle increased traffic volumes and improve travel times. The projects include:

1. CR 350S from CR 50E to South 9<sup>th</sup> Street;
2. Beck Lane from Old US 231 to CR 50E;
3. CR 500S between relocated US 231 and old US 231; and
4. SR 43, to four lanes, from Prophetstown State Park's new road to the I-65 interchange.

Other projects in the **2025 Transportation Plan** will include:

1. Extending Farabee Drive south to McCarty Lane; and
2. Completing the construction of Duncan Road north of US 52.

This Plan serves as an overview, a system-wide description of major capital improvements. There are and will be other localized concerns about traffic circulation and operations that we do not address. This broad overview does help member governments examine their own objectives within the context of areawide needs.

This further update of the 1978 plan continues to meet community-wide social and economic goals and objectives established earlier. Unimagined changes will happen, which will require us to modify objectives and solutions to problems. We remain alert to the realities of urban development which may require us to modify previously developed strategies. As such, a plan is not an end in itself but rather a means of satisfying and attaining our current goals and objectives. Additionally, this plan meets requirements mandated by the Transportation Efficiency Act for the 21<sup>st</sup> Century (TEA 21), the landmark federal legislation which directs transportation funding over this six-year period.

## **PROJECTED COSTS**

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Clearly, it will cost a significant amount of money to complete all components of the **2025 Transportation Plan Update**. Staff projects the total over 25 years at just over \$638 million, in constant 2000 dollars. Proposed State Highway projects make up 66.4% of the total. Improvements to our network of local streets and highways account for 29.8%. The remaining 3.8% would result from private development. Almost half (43.2%) of all expenses involve just three projects: the US 231 relocation to I-65, the Hoosier Heartland Corridor, and widening I-65. Anticipated costs are summarized in **Table 1**.

In the remaining chapters of this updated **Transportation Plan**, this amendment to the **Comprehensive Plan for Tippecanoe County**, we will provide an in-depth look at how the plan was created (the numbers we used as input, the modeling process, the resulting output -- the details of its proposals), and how it is to be implemented (project staging and financial resources).



We encourage those readers interested in the history of transportation in our community to read Chapter I in ***the Final Report of the Greater Lafayette Area Transportation and Development Study (1978)***. The Introduction to the ***Comprehensive Plan for Tippecanoe County*** contains a history of planning in the community and extensive information on the land and its people.

**Table 1**

<b>2025 Transportation Plan Update: Summary of Projected Cost by Jurisdiction (in thousands)</b>			
Network	<b>2010</b>	<b>2025</b>	<b>Total</b>
Lafayette	73,276	9,900	83,176
West Lafayette	19,665	2,100	21,765
Tippecanoe Co.	34,303	46,463	80,766
INDOT	170,561	253,130	423,691
Private Development	11,760	12,600	24,360
Town of Dayton	4,620	0	4,620
<b>Network Total</b>	<b>314,185</b>	<b>324,193</b>	<b>638,378</b>